

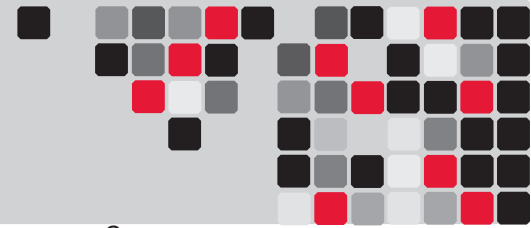
# ToughTech™ Duo

## User Manual



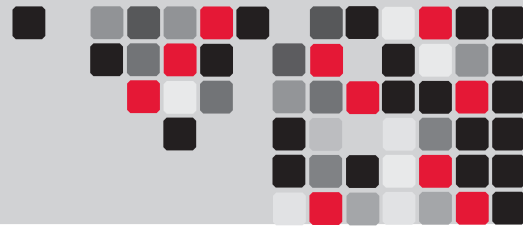
### Features

- RAID 1, RAID 0 and Single Drive operation modes.
- Default RAID 1 Mirroring to assure data integrity and protection on the road.
- Designed for optimal heat dissipation.
- Easy-release removable 2.5" drive sleds.
- Designed for Solid State (SSD) & standard SATA HDDs.
- Quad host connectivity: eSATA, FireWire 800/400 & USB 2.0.
- FireWire is daisy-chainable with bus power.
- Can operate on power from FireWire connection.
- New user friendly display menu, input selection & drive health monitoring.
- Uses S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) to track hard drive health, alerting user of potential problems
- User-selectable temperature, warning, and alarm settings (LEDs and audible).
- DC power available for USB & eSATA operation. Power adapter included.
- Drive sleds allow for drive insertion/removal without tools.



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## 1. Pre-Installation Steps

### 1.1 ToughTech Duo Duo Accessories

Check the accessoires with your ToughTech Duo. Please contact CRU if any parts are missing or damaged. The box should contain the following items:

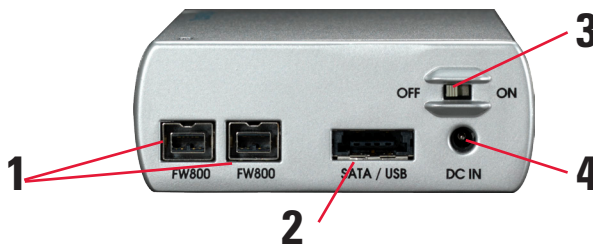
ToughTech Duo unit	1
Power adapter	1
eSATA cable	1
FW800 cable	1
USB type A to A cable	1
FW800 to FW400 cable	1
Screw kit	1
Quick Start Guide and Warranty Information	1

### 1.2 Identifying Parts

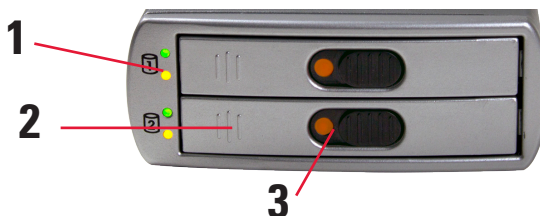
Take a moment to familiarize yourself with the parts of the ToughTech Duo. This will help you to better understand the remaining instructions.



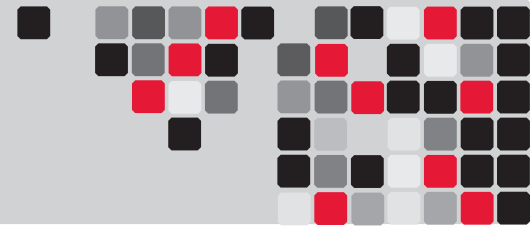
- 1. Unit Power, System, RAID LEDs
- 2. LCD Screen
- 3. Navigation Buttons



- 1. FireWire Ports
- 2. eSATA/USB Combined Port
- 3. Power Switch
- 4. Power Supply Input



- 1. Drive Power and Drive Activity LEDs
- 2. Drive Sled Ejection Button
- 3. Slide Locks



## 1.3 Consider your RAID Configuration

If you purchased ToughTech Duo with drives pre-installed and pre-configured, skip to Hardware Setup.

ToughTech Duo supports RAID 0, RAID 1 and a single drive. Consider which configuration best suits your needs. All hard drives must be initialized prior to use in the ToughTech Duo. It is not possible to add a drive to ToughTech Duo and access pre-existing data on that drive. The hard drive must be initialized by the unit, which will cause the loss of all data on the drive. The drive(s) must be configured to RAID 0, RAID 1 or a single drive.

### 1.3.1 RAID 0

In this mode, the unit will configure the drives in a “striped” RAID. This will split your data between the drives, offering faster performance and allowing you to use the full capacity of the drives in a single volume. However, this mode offers no protection for the data; if either hard drive were to fail, all data would be lost.

### 1.3.2 RAID 1

In this mode, the unit will “mirror” the two drives for best data protection. In this mode, you will work with a single volume equal in size to the capacity of one drive. When you copy data to the volume, ToughTech Duo will simultaneously write the data to both drives. If one drive were to fail, your data would still be preserved on the other drive. After replacing a failed drive you can rebuild the RAID on the fly so that your data is once again redundant and secure.

### 1.3.3 Single Disk Mode

In this mode the unit will support a single drive.

**NOTE:** There is no way to convert a drive in Single Disk Mode to RAID 1 without creating a new array which will cause loss of the data on the hard drive.

## 2. Hardware Setup

### 2.1 Installing Hard Drives

ToughTech Duo is compatible with 2.5-inch SATA hard drives that are no more than 9.5 mm in height. Follow these steps for installing or removing a drive.

- Push the ejection button. The handle will swing open.
- Remove the drive sled and swing the side panel out.
- Insert the drive with the label up.
- Close the side panel. Ensure the panel is flush with the drive.
- Secure the drive with the provided screws (optional).
- Slide the drive sled back into the unit.
- Close the handle and ensure the sled is securely in place.

**NOTE:** If any of the drives are inaccessible after powering on the unit, try the following steps:

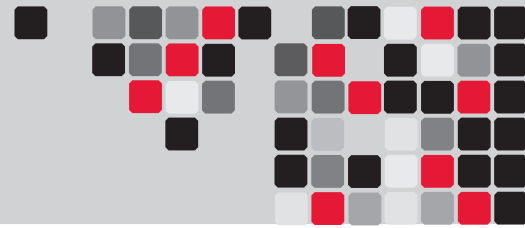
1. Turn off the power.
2. Remove the drive(s) in question.
3. Reinsert the drive(s).
4. Turn on the power.



Step a



Step b



## 2.2 Connecting and Powering ToughTech Duo

- a. Connect the data cable (USB, FireWire, or eSATA) to the corresponding port on ToughTech Duo. Note: USB and eSATA share the same port.
- b. Provide power to the ToughTech Duo. There are two possible ways to do this.  
 Option 1: If the FireWire host on your computer is powered, ToughTech Duo can use FireWire for power.  
 Option 2: Plug the included AC adapter into the DC jack on the rear of the ToughTech Duo. Plug the other end into a grounded electrical outlet.
- c. Plug the other end of the data cable to an available port on your computer. Ensure that the green power LED indicator is active.

## 3. LED Behavior

(see section 1.2 for locations of the LEDs on the unit)

**NOTE:** Not all hard drives support the Drive Activity LED functionality in the same way.

Unit Power	Glows green when the power switch is in the "on" position
System	LED is "off" by default Configurable (see sections 7.3 and 7.4) Glows AMBER when a drive reaches a default temperature (50 °C), or a temperature that you set. Glows RED when a drive reaches a default temperature (55 °C), or a temperature that you set.
RAID	LED is "off" by default Glows AMBER when the RAID is degraded Glows RED when the RAID has failed or is invalid
Drive Power	Glows GREEN when the drive is in the unit and receiving power
Drive Activity	Glows AMBER when the drive is being accessed, either reading or writing from the drive.

## 4. LCD Menu Screens

(use the Navigation Buttons to change screens)

Mode/Status	The RAID level used Status of RAID: Normal or Degraded
Drive Status	OK: Indicates that the hard drive is in use or ready to use No Disk: Indicates that the hard drive was removed or not installed Unused: A new drive was installed and not added to the RAID Failing: Indicates the drive is malfunctioning. Possible causes of failure message include an inability to recognize the drive, a compatibility problem, or damaged sectors.
Drive Temp	Displays temperature of the top and bottom drives, as reported by S.M.A.R.T status
Change RAID mode	Allows you to change the RAID level (see section 5.2)

## 5. Setting up the RAID

ToughTech Duo offers two options for RAID configuration as well as single-disk mode. See section 1.3 for details on the available options. Stop all data transfers before setting or changing RAID types or rebuilding a degraded array. Failure to do so can result in the loss of data. To set up or change the RAID type, disconnect all data cables and reboot ToughTech Duo. After the unit has initialized, the LCD will display the drives' mode and status. You can then reconnect to the computer.

### 5.1 Creating a New RAID

(Use the LCD and interface buttons to complete this step)

Follow these steps for setting up a new RAID if you did not purchase your unit pre-configured.

- Upon insertion of new disks, the LCD will read "Raid Error: not a RAID set."
- Press "Enter" on the front interface twice.
- The LCD screen will display "MAKE A NEW RAID?"
- Select "YES."
- Select your RAID type (RAID 0 or 1)
- The LCD screen will read "Will erase all data OK?"
- Select "YES." The RAID is now created.

**WARNING:** Changing RAID levels will erase any data on the drives. Make a backup copy of any data you wish to keep before changing the RAID.

### 5.2 Changing the RAID Type

- Press the Up button, for the "Change RAID Mode" screen.
- Press the Enter button.
- Press the Down or Up button to select the desired RAID type.
- The screen will display "Will Erase all Data." Selecting "OK" will result in the loss of all data on the drives.  
(Ensure all data is backed up prior to pressing OK.) If you're ready to continue, press Enter.
- The new configuration will be selected and ToughTech will reboot.
- ToughTech has been configured and is ready for operation. Follow the instructions for the appropriate operating system usage instructions to initialize and format the drives.

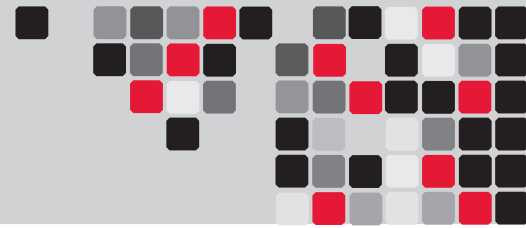
**WARNING:** Any data on the new disk will be destroyed when the drive is added to the RAID.

## 6. Adding a New Disk

### 6.1 RAID 1

In the event of a disk failure or removal for a RAID 1, the RAID will continue to function in a degraded state. Add a new disk to ToughTech Duo to rebuild the RAID.

After the new drive has been detected ToughTech Duo will ask to add a new disk. Press the Enter button to select "YES" to add the disk. The disk will be added to the RAID and the RAID will begin to rebuild. The LCD screen will display the percent complete for the rebuild. Rebuild times vary; a 1TB hard drive takes just over 3 hours to rebuild.



## **RAID is not a Backup**

Because your ToughTech Duo features a redundant RAID mode which protects against a hard drive mechanical failure, it is an excellent part of any backup strategy. However, a RAID is not, in itself, a backup strategy. Many things besides hard drive failure can damage or erase your data:

Corruption caused by unexpected disconnection during data access (e.g. a cable is unplugged during a data transfer, or the computer crashes or loses power while writing to the drives)

- Corruption or destruction caused by viruses or other malware
- Sabotage by a disgruntled employee or acquaintance
- Theft or loss of your ToughTech Duo
- Natural disasters such as fire, flooding, etc.

Considering these possibilities, any single copy of your important data must always be considered at risk. That's why backing up is so important. Follow the 3-2-1 backup rule. Your data should exist in three different places on two different storage media and at least one of those copies should be maintained offsite.

If you do not have an effective backup strategy, you may not be able to recover your data, or the cost of recovery may be quite expensive. Our warranty does not cover costs associated with data loss (nor do the warranties of other hard drive manufacturers).

We know it would be heartbreaking to lose your data, so please plan accordingly!

### **6.2 RAID 0**

Never remove a drive from a RAID 0 as this will cause the loss of all data. In the event of a disk failure for a RAID 0, the RAID will be destroyed. Add a drive and then press the Up button to create a new RAID. Follow the display prompts to build a new array.

### **6.3 Single Disk Mode**

In the event of a drive failure in Single Disk mode, all data will be lost. Single Disk mode allows usage of a single hard drive. If a second drive is added later, it cannot be combined with the first disk, nor will it provide the option of two individual disks to be seen by the host computer. It will allow the option to create a new RAID using both disks, though this will destroy any data on both disks.

## **7. Buzzer and Temperature Configuration**

If you would like to set a password for security, enable or disable audible alarms, or change the temperature thresholds for heat warnings and alarms, you may do so using a free software utility known as Configurator. To download the Configurator software and user's manual, please visit <http://www.wiebetech.com/software/configurator.php>. WiebeTech is a brand of CRU.





## 7.1 Configuration PIN

This feature allows you to set a PIN to prevent unauthorized configuration. The default PIN is 0000. ToughTech Duo only requires you to enter a PIN if a different value has been set.

**NOTE:** Some features of the Configurator are not applicable to ToughTech Duo. Examples include the fan kick-on and Enclosure Temp setting.

## 7.2 Buzzers

Place a check in the boxes to indicate which warning/alarm buzzers you want to be activated.

## 7.3 System Warning Buzzer

This buzzer will sound when a drive reaches a default temperature, or a temperature that you set (see section 7.7).

As a visual alert, the “system” LED will glow amber when the temperature is reached.

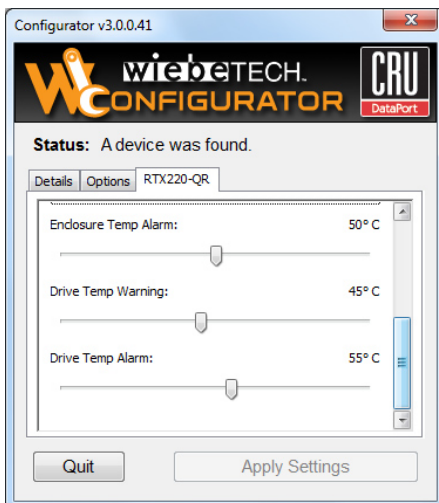
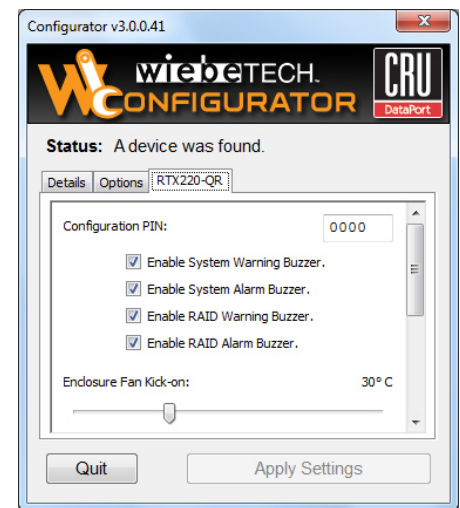
## 7.4 System Alarm Buzzer

This buzzer will sound on one occasion:

- When a drive reaches a default temperature or the temperature that you set (see section 7.7).

## 7.5 RAID Warning Buzzer

This buzzer will sound when ToughTech Duo is in degraded RAID mode (i.e. a drive has failed and is in need of rebuild, or the RAID is currently rebuilding). The “RAID” LED will glow amber if this occurs.



## 7.6 RAID Alarm Buzzer

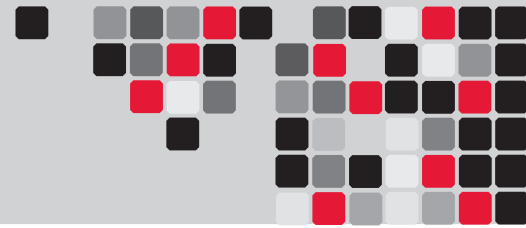
This buzzer will sound when the RAID has failed or is invalid. The “RAID” LED will glow red if this occurs.

## 7.7 Temperature Sliders

When your ToughTech Duo reaches a certain temperature, the System LED lights up, and buzzers will sound (unless you configure them not to do so). You may want to change these default temperatures according to your environment. With these “sliders,” you can change the default temperatures of the:

- Drive Temperature Warning
- Drive Temperature Alarm





## 8. Usage with Mac and Windows Operating Systems

### 8.1 Usage with Macintosh Computers



#### 8.1.1 Compatibility

ToughTech Duo requires no drivers for operation with OS X.

#### 8.1.2 Mounting and Ejecting Volumes

When you connect the unit to the Mac for the first time and turn on the power, you'll probably see a message saying that the disk is unreadable. This is because you must format the volume before using it. The easiest way to do this is to use Mac OS X's Disk Utility. If you plan to use the unit on both Macs and PCs, select "MS DOS File System" as the format type. If you only plan to use the unit on Macs, then select "Mac OS Extended". After the volume is formatted, an icon representing the drive volume will appear ("mount") on the desktop. You can now use the volume just like an internal hard drive.

Eject the volume before powering down the unit by dragging the volume's icon to the trash bin, or by selecting the volume then pressing Command-E. Shutting down the unit without first ejecting the volume can result in data loss.

#### 8.1.3 Booting to the ToughTech

Some Macs support booting from FireWire devices. To activate this feature, you must first install OS X on the external volume. The easiest way to do this is to clone an existing system drive using a drive cloning utility. Next, go to System Preferences --> Startup Disk. A window will list the available bootable volumes. Select the volume from which you wish to boot. Another method is to hold down the Option key during startup. A screen should appear that allows you to select the volume you wish to use. This is useful if you wish to boot from your ToughTech only some of the time.

### 8.2 Usage with Windows Operating System



#### 8.2.1 Compatibility

ToughTech is compatible with Windows XP, Vista, and Windows 7. No drivers are needed.

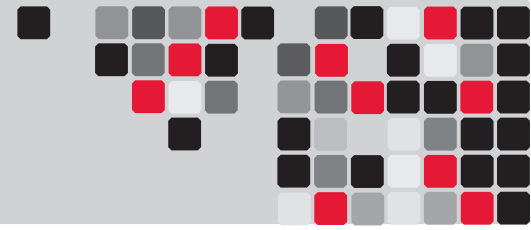
#### 8.2.2 Mounting and Ejecting Volumes

Before you can use your ToughTech, you must first format the drives into a volume. Use Disk Management, which you can find by right-clicking on My Computer then selecting Manage. Select NTFS for the format type. If you wish to format FAT-32 for cross-platform compatibility, you will need to use a third-party utility to do so. Windows XP will not create FAT-32 volumes larger than 32GB.

After the volume is formatted, an icon representing the drive volume will appear in My Computer. You can now use the volume just like an internal hard drive.



If ToughTech is connected to your computer via FireWire or USB, always eject the device by clicking the taskbar "eject" icon before turning off power or unplugging the data cable. Failing to do so could result in data corruption on the drive. When connecting via eSATA, you will not be able to eject in this way. However, it is possible to disable the device using Device Manager. Whether or not you choose to disable the device in this way, always make sure the drives are not being accessed before shutting off ToughTech to avoid data loss.



## 9. Frequently Asked Questions (FAQ)

**Q: Why won't the computer let me eject or unmount my drive?**

A: There may be a software application running in the background with an active link to the drive. Sometimes, you may see a message such as "The disk is in use and could not be ejected. Try quitting applications and try again."

It could be a background application like Sherlock or the Finder. This is not a defect or issue caused by the WiebeTech device. Try invoking the Force Quit feature in OS X to see what software may be running. For Windows XP, the equivalent command is CTRL-ALT-DEL.

Drives connected to the computer via eSATA cannot be ejected in Windows the way FireWire drives can. However, freeware utilities are available on the internet that provide a similar function.

**Q: I've attached my ToughTech Duo and can see the volume, but it shows up twice. Which one is real?**

A: If you are seeing your ToughTech volume mounted twice, chances are the unit is connected to the computer using both the eSATA and FireWire connections. When this is the case, the OS may attempt to mount the ToughTech twice resulting in two volumes appearing. Simply turn off the ToughTech and unplug one of the connections to resolve the problem.

**Q: Why does my eSATA device appear as a Parallel SCSI device in System Profiler?**

A: The "Serial ATA" tab in System Profile shows devices attached to the internal SATA bus, but not always devices attached to an eSATA host card. Sometimes these devices will appear under the heading "Parallel SCSI" instead. This is entirely normal and does not indicate a problem with the device or its drivers.

**Q: What hard drives work with ToughTech Duo?**

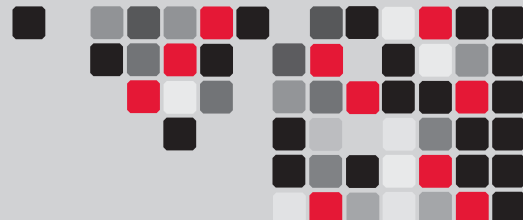
A: ToughTech Duo accepts 2.5-inch SATA hard drives that are no more than 9.5 mm in height.

**Q: Will this product work with hard drives larger than 2.2TB?**

A: Yes, assuming the rest of your configuration (e.g. OS, BIOS, host drivers) supports large volumes, this product is compatible with drives larger than 2.2TB.

**Q: The Drive Activity LED on my ToughTech Duo isn't lighting up. Is there something wrong with my unit?**

A: Not all hard drives support the Drive Activity LED functionality in the same way. For example, some drives, such as some models of Solid State Drives do not report drive activity at all.



## 10. Technical Specifications

Product name/code	ToughTech Duo
Interface Types & Speeds	eSATA - up to 3.0 Gbps Dual FireWire 800 (400 compatible) - up to 800 Mbps USB 2.0 - Up to 480 Mbps
RAID Levels Supported	RAID 0 (striped) or RAID 1 (mirrored)
Drive Compatibility	All 2.5" SATA hard drives that are no more than 9.5mm high
Power Switch	2 position: on/off
Operating System Requirements	Windows 7, Vista, or XP Mac OS X Linux distributions using kernel version 2.4 or above
Compliance	FCC, CE, RoHS
Product Weight	1.65 pounds with drives, 1.05 pounds without drives (excluding accessories)
Product Dimensions	159mm L x 89mm W x 35 mm D
Warranty	2-year limited warranty. See warranty statement for details and limitations. We don't want anything to go wrong with your CRU product. But if it does, tech support is standing by and ready to help. Contact us at <a href="http://www.cru-dataport.com/technical-support/customer-technical-support.php">http://www.cru-dataport.com/technical-support/customer-technical-support.php</a>

ToughTech is a trademark of CRU Acquisitions Group, LLC. Other marks are the property of their respective owners.  
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### Product Warranty

CRU warrants this product to be free of significant defects in material and workmanship for a period of two years from the original date of purchase. CRU's warranty is nontransferable and is limited to the original purchaser.

### Limitation of Liability

The warranties set forth in this agreement replace all other warranties. CRU expressly disclaims all other warranties, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose and non-infringement of third-party rights with respect to the documentation and hardware. No CRU dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty. In no event will CRU or its suppliers be liable for any costs of procurement of substitute products or services, lost profits, loss of information or data, computer malfunction, or any other special, indirect, consequential, or incidental damages arising in any way out of the sale of, use of, or inability to use any CRU product or service, even if CRU has been advised of the possibility of such damages. In no case shall CRU's liability exceed the actual money paid for the products at issue. CRU reserves the right to make modifications and additions to this product without notice or taking on additional liability.

FCC Compliance Statement: "This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a home or commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at this own expense.

In the event that you experience Radio Frequency Interference, you should take the following steps to resolve the problem:

- 1) Ensure that the case of your attached drive is grounded.
- 2) Use a data cable with RFI reducing ferrites on each end.
- 3) Use a power supply with an RFI reducing ferrite approximately 5 inches from the DC plug.
- 4) Reorient or relocate the receiving antenna.

